



Q3 SAG Meeting
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Income Eligible Weatherization Customer Bill Impacts

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Introduction

- From ComEd Stipulation Agreement:
 - *ComEd will track bill impacts and reduced energy burden based on deemed savings across all IE customers, for each IE offering*
 - *ComEd will also pilot ways to track actual bill impacts and reduced energy burden for a portion of IE Single-Family and Multi-Family customers, which will be for the purpose of facilitating follow up with customers to determine if actual savings were in line with projections.*
- ComEd, Nicor Gas, and Peoples Gas/North Shore Gas jointly engaged Resource Innovations to analyze the combined impacts of several programs on IE customers' electric and natural gas bills
 - Estimate achieved energy and bill savings across five different IE programs using customer billing data
 - Investigate best practices for utility communication on potential bill impacts of EE projects to customers



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Research Overview

Background

- Resource Innovations contracted with ComEd (through CLEAResult and Illume), Nicor Gas, and Peoples' Gas / Northshore Gas to perform analysis of income-eligible programs offered in their service territories
- The primary goal of this research is to support improvements to program design and customer experience through the following tasks:
 1. Determine achieved energy and bill savings attributable to program participation and estimate future bill savings potential of the programs
 2. Identify opportunities, challenges, and best practices for communicating bill savings to customers

Programs

Acronym	Program Name	Description	Utilities
SF IHWAP	Illinois Home Weatherization Assistance Program – Single Family	Provides weatherization and efficiency improvement measures to single-family low-income residents, including elderly, disabled, families with children, and homes with high energy burden.	ComEd Nicor PG-NSG
MF IHWAP	Illinois Home Weatherization Assistance Program – Multi-Family	Provides weatherization and efficiency improvement measures to multi-family low-income residents, including elderly, disabled, families with children, and homes with high energy burden.	ComEd Nicor PG-NSG
IEMS	Income Eligible Multi-Family Savings Program	Provides energy efficiency upgrades to multi-family low-income customers, including both in-unit and common area measures.	ComEd PG-NSG
PHES	Public Housing Energy Savings Program	Allows public housing authorities (PHAs) to achieve energy savings for their residents through in-unit and common area upgrades.	ComEd Nicor PG-NSG
CBA (SFIE)	Chicago Bungalow Association Program (Single Family Income Eligible)	Offers no-cost home energy assessments and includes free weatherization services and installation of energy-saving products to increase comfort and lower utility bills.	ComEd PG-NSG

Approach



Achieved Savings

- ✓ Data request and validation
- ✓ Customer-level monthly billing data sets
- ✓ Weather normalized pre/post regression model analysis



Future Potential Savings

- ✓ Forecast future program participation using rolling 3-year averages based on 2018-2021 participation levels
- ✓ Apply per customer annual savings found by achieved savings analysis
- ✓ Consider other, potentially relevant measures based on experience with similar programs



Research & Interviews

- ✓ Primary research on these and other jurisdictions with similar programs
- ✓ Conduct in-depth interviews with key program staff
- ✓ Common practices for bill tracking and communication

Billing Analysis Challenges

Billing Analysis Challenges

1. Low program participation
2. Inability to perform measure-level savings analysis
3. Lack of control group
4. Customers with multiple measure installation dates



Outcomes/Solutions

1. Only programs having adequate sample can be reliably evaluated.
2. Measures are offered in bundles and therefore, measure-level savings cannot be estimated
3. Absent a control group, a weather-normalized pre/post regression analysis is the best approach for estimating savings using monthly billing data
4. For customers who implemented multiple measures separated by more than one month, use the earliest implementation date to define the post period

Program Participation

- Small sample sizes lead to inconclusive results
- Several programs were affected by low participation and/or attrition during the data cleaning process
- Programs that do not produce statistically significant results are excluded from the study

Achieved statistical significance Included in analysis	Did not achieve statistical significance Excluded from analysis
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Program	Customer Counts		
	ComEd	Nicor	PG-NSG
Single Family IHWAP	1,487	1,447	439
Multi-Family IHWAP	235	25	142
Income-Eligible Multi-Family Savings	142	---	558
Public Housing Energy Savings	23	24	6
Chicago Bungalow Association	2,843	---	3,305

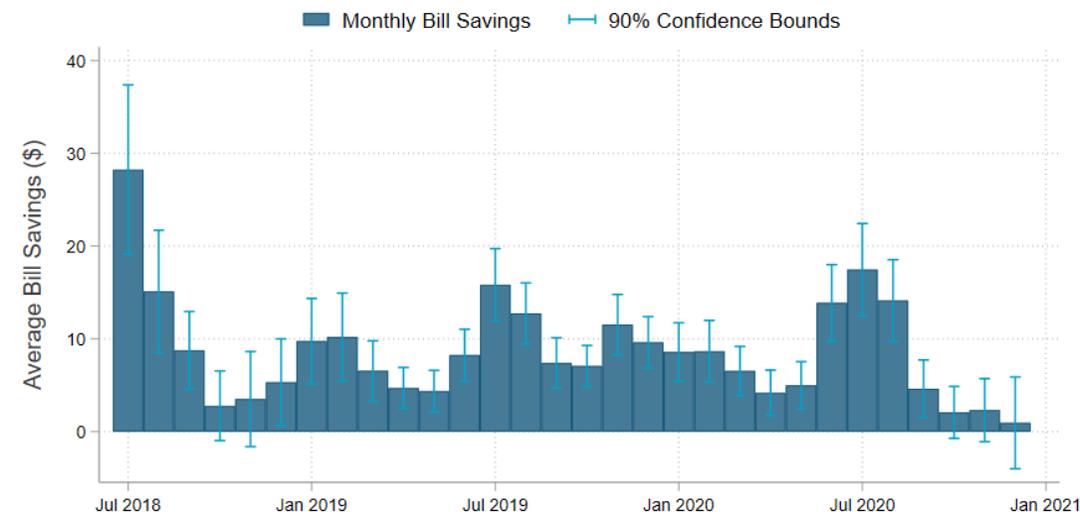
Bill Savings Analysis Results



Single Family IHWAP

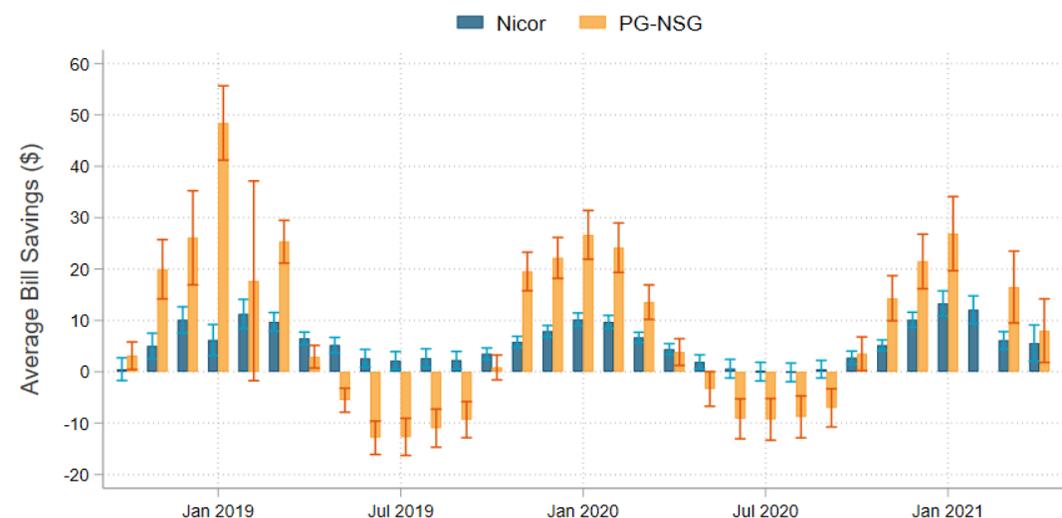
Electric Bill Savings

- Savings observed in all months
- Greatest savings during summer months
- Average annual savings per customer = \$106



Gas Bill Savings

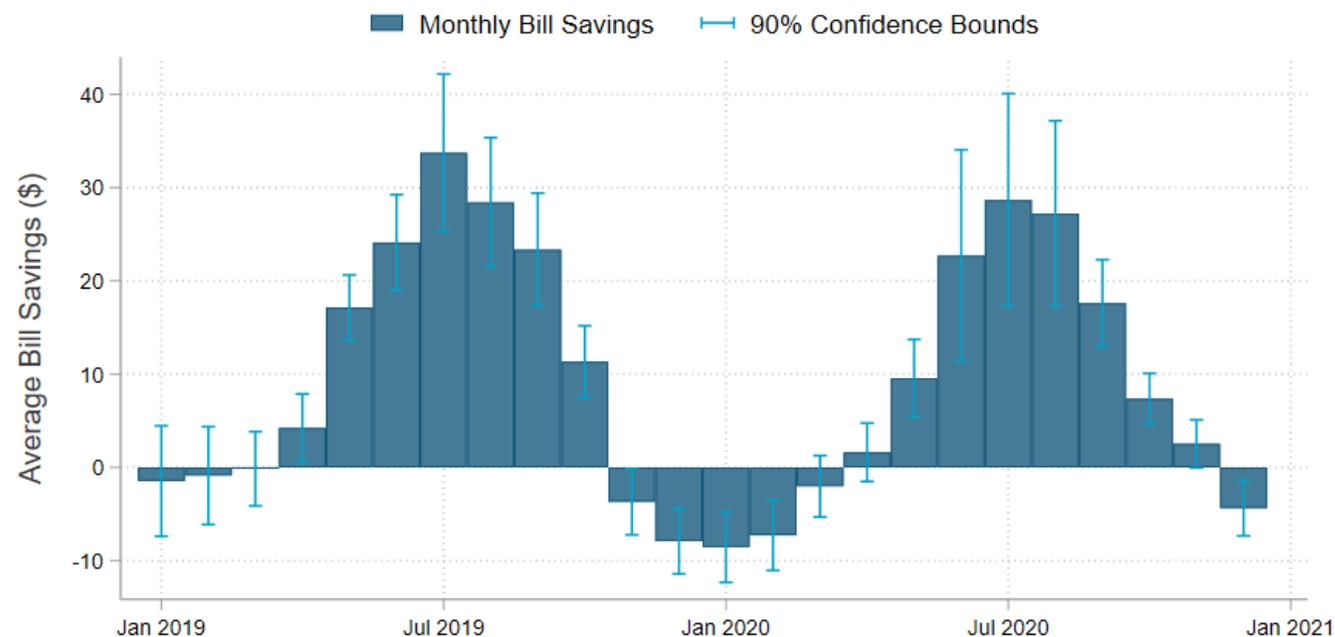
- Seasonal savings trend
- PG-NSG customers save more than Nicor customers
- Average annual savings per customers:
 - Nicor = \$117
 - PG-NSG = \$84
 - Nicor + PG-NSG combined = \$97



Multi-Family IHWAP

Electric Bill Savings

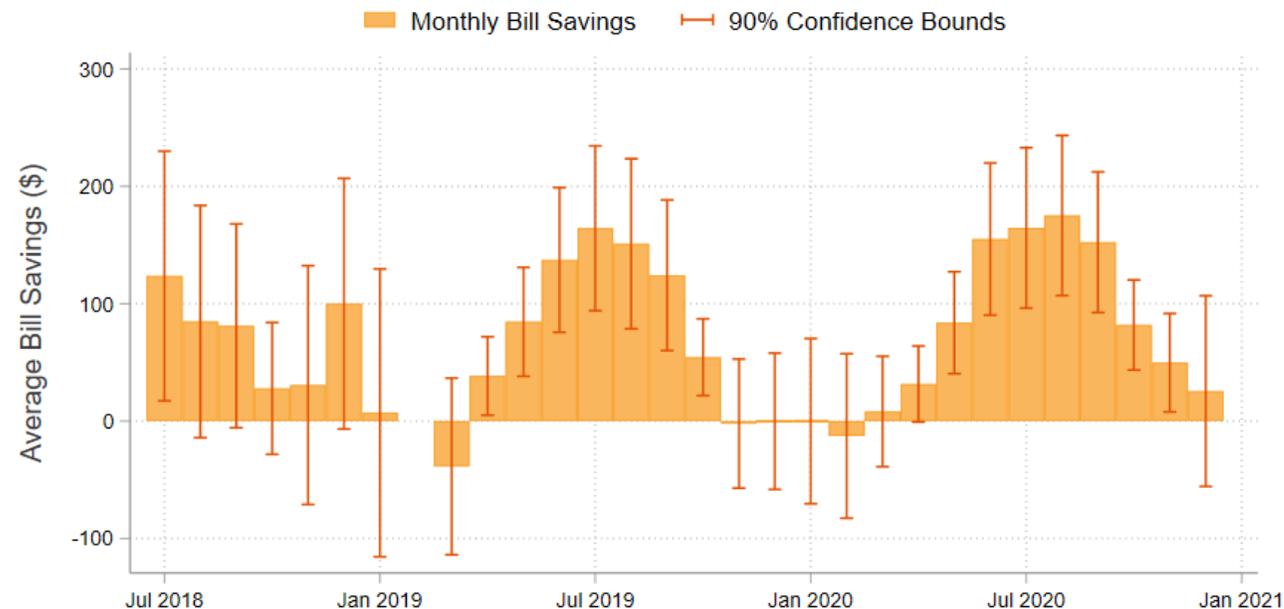
- Large savings occur in summer months
- Little or no savings in winter months
- Average annual savings per customer = \$111



Income-Eligible Multi-Family Savings

Gas Bill Savings: PG-NSG

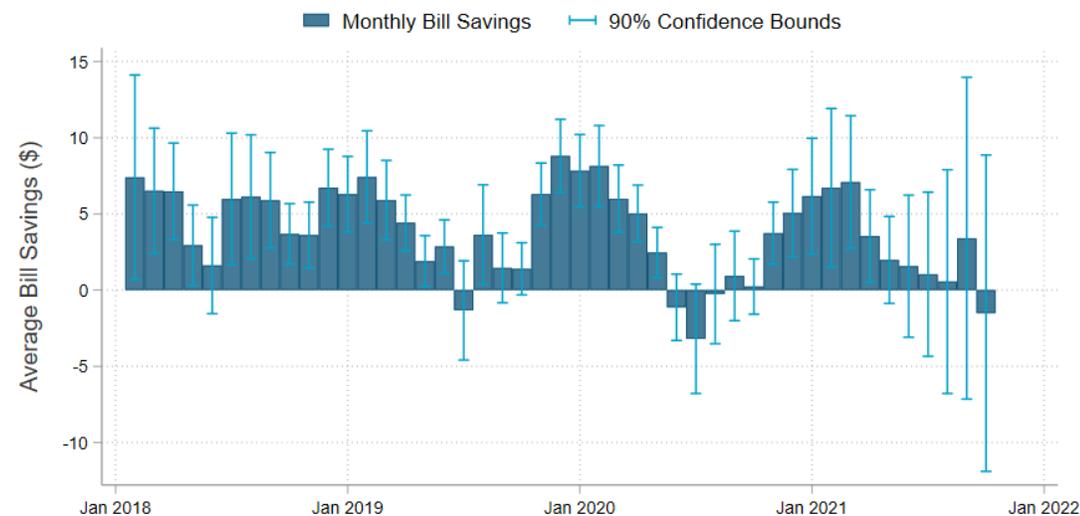
- Largest savings occur in summer months
- Average annual savings per customer = \$480



Chicago Bungalow Association

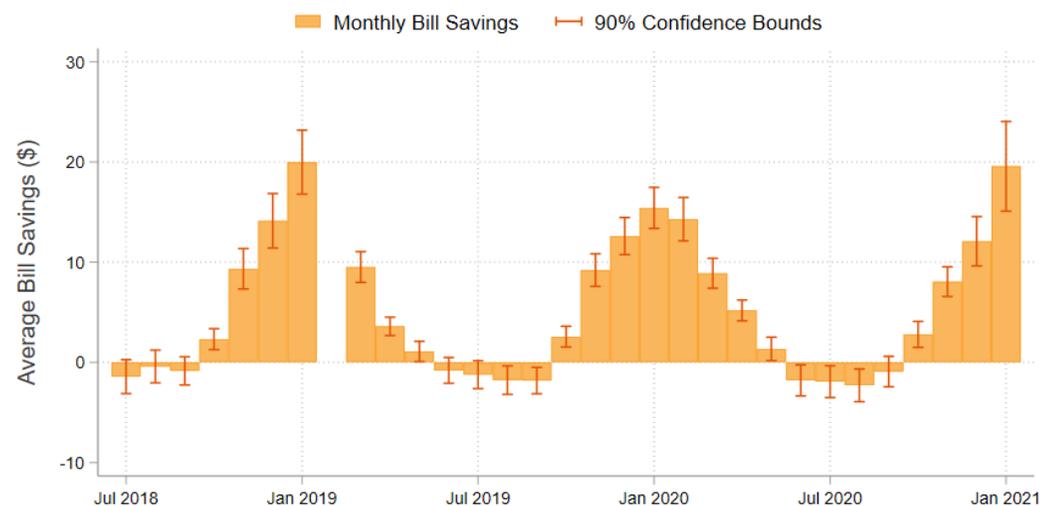
Electric Bill Savings

- Savings observed in all months
- Not as seasonal as other programs
- Average annual savings per customer = \$32



Gas Bill Savings: PG/NSG

- Seasonal trend in monthly savings
- Little or no savings during summer months
- Average annual savings per customer = \$86



Per Unit Gas Prices

Bill savings are influenced by market conditions

- Natural gas is a commodity and its price fluctuates according to supply and demand across the country
- Significant rise in per unit (\$/therm) gas price in 2021-2022 during study period
- Participants pay more per unit of consumption which offsets program impacts
- Accounts enrolled in 2020-2021 show negative bill savings due to price

Figure: Average Gas Commodity Price

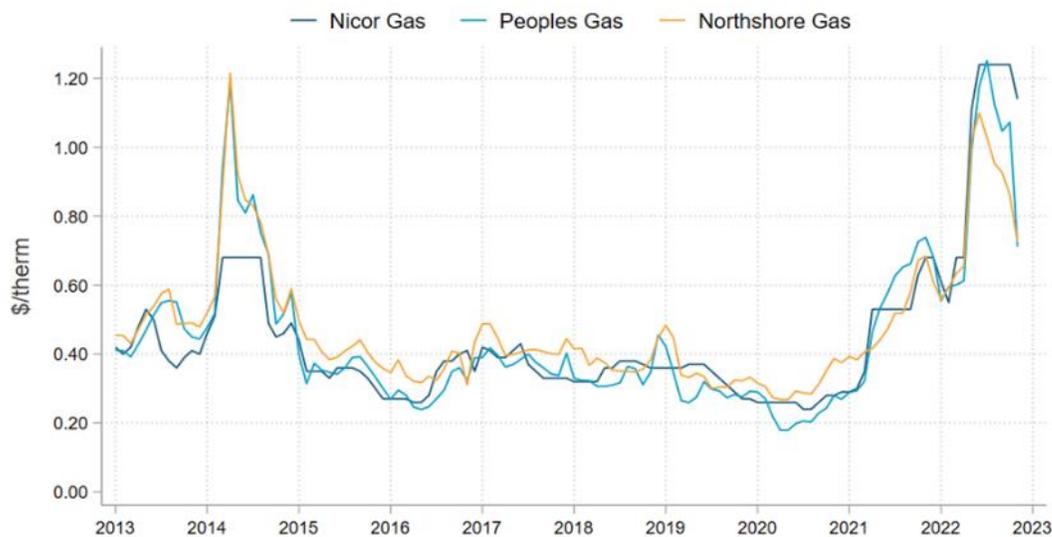
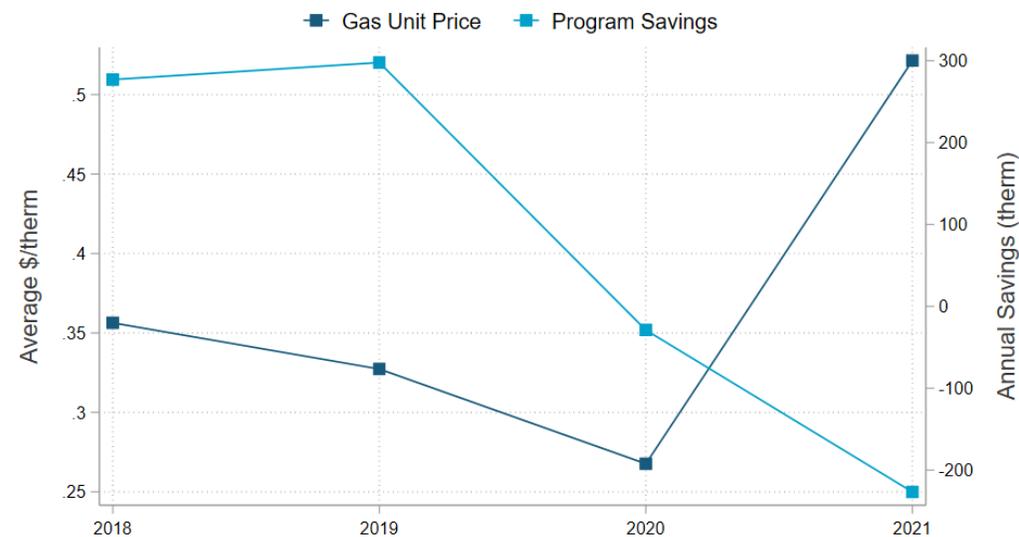


Figure: Gas Price vs. Program Savings



Research & Interviews



Bill Tracking & Communication

Research

Literature review and secondary research on income-eligible and weatherization programs
Programs offered by ComEd, Nicor Gas, PG-NSG, as well as MassSave, NYSERDA, and DTE Energy
Understand participation, projects completed, measures offered, savings/bill tracking, customer communications

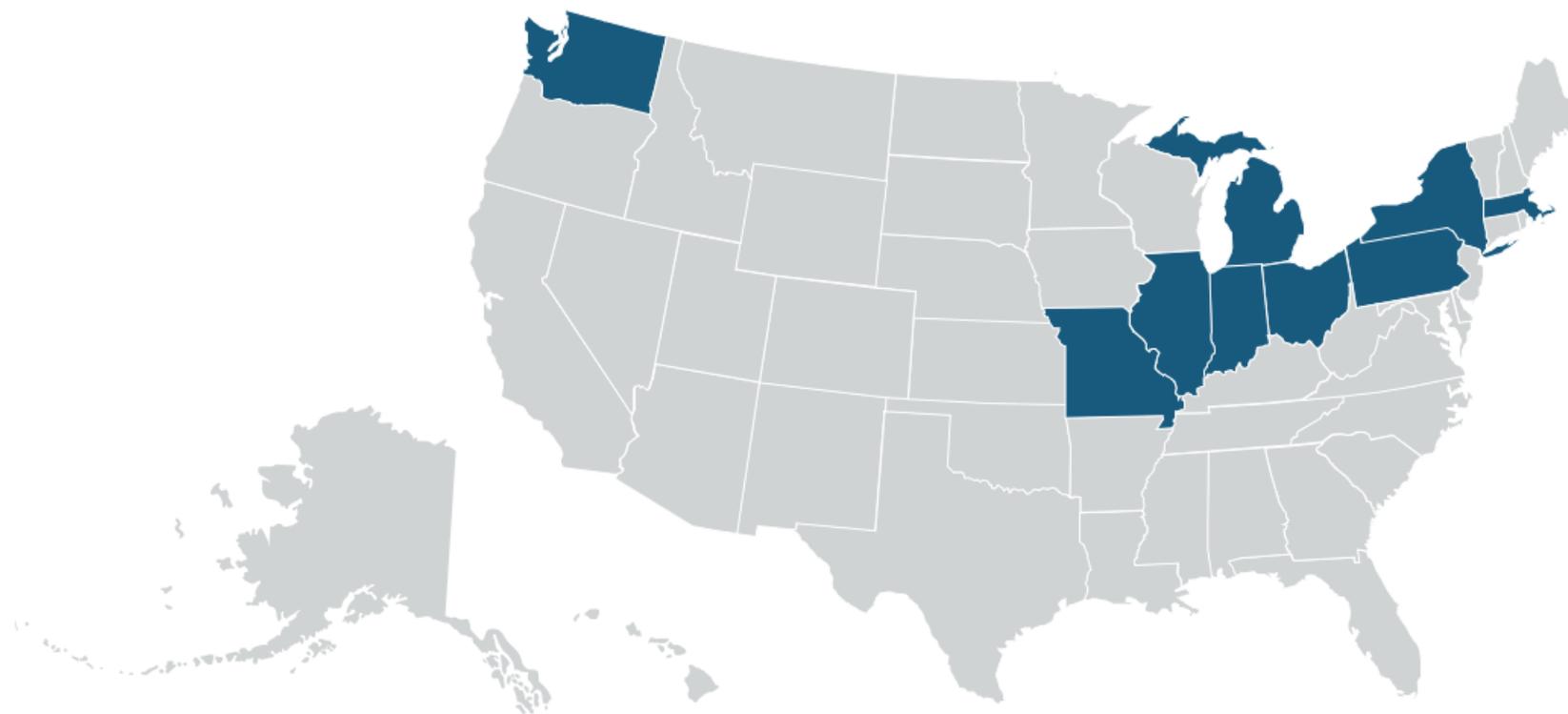
Interviews

Seven in-depth interviews with program staff
Programs offered by ComEd, Nicor, PG-NSG, Centerpoint, Ameren, PECO, Puget Sound Energy
Gather information about customer experience, methods for communicating bill impacts, best practices, and overall effectiveness of such communications

Lessons Learned

Summarize methods currently in use for tracking and/or communicating bill impacts
Identify challenges, barriers, best practices, and other considerations

Map of States Represented



Key Findings

- Energy usage and bill savings are estimated in two primary ways:
 1. Measure-specific approach using regional TRM-calculated savings
 2. Household-level savings analysis approach (i.e., billing analysis)
- Communicating expected energy and/or bill savings directly to customers must be done with caution, if at all
 - Important to manage customer expectations
- Among the utilities interviewed by RI, activities around bill tracking and communication are very limited
 - None of the utilities included in the research track/communicate savings for single-family or multi-family residents
 - Occasionally used as a tool to secure program participation from multi-family building owners/managers



Red Flags

<p>Equity</p>	<p>Some customers may qualify for measures that their neighbors do not, and as a result achieve different savings. Utilities aim to avoid comparisons between customers that may not understand reasons for different measures received and/or performance.</p>
<p>Changes in Usage</p>	<p>Outside factors unrelated to the program can influence consumption and lead to false impressions. For example, changes in occupancy, home modifications, lifestyle and/or behavioral changes, other efficiency measures installed can bring on changes in pre- and post-usage patterns and result in lower bill savings than expected.</p>
<p>Weather</p>	<p>Unseasonal or extreme temperature fluctuations may lead to changes in heating/cooling requirements that can significantly impact actual bill savings.</p>
<p>Commodity Price</p>	<p>Electricity or natural gas supply costs may change after the measures are implemented. This could produce a situation where energy consumption is reduced after program treatment, but customer utility bills are larger than before treatment.</p>
<p>Education Barriers</p>	<p>Customers may not understand that expected dollar savings are only an estimate and actual savings vary based on a myriad of factors, such as those described above.</p>

Tracking and Communication Methods

Savings Tracking Method	Considerations
TRM-Based Deemed Savings	<ul style="list-style-type: none"> Provides consistent savings values adopted for a given jurisdiction. Additive measure savings likely overstate whole home savings because interactive effects and some site-specific information is not considered.
Whole Home Billing Analysis	<ul style="list-style-type: none"> If sufficient participation is available, a pre/post billing analysis can provide more accurate results that take into account interactive effects. Accounts for customers' responsiveness to changes in weather and market conditions.
Calibrated Energy Modeling	<ul style="list-style-type: none"> Able to provide robust per home savings. Cost is extremely expensive.
Bill Tracking Method	Considerations
Pre/Post Treatment Comparison	<ul style="list-style-type: none"> Customer bills should be examined in the same number of months and seasons. Changes in per unit energy costs (kWh or Therms) as well as non-energy charges should be taken into account.
Self-Guided Comparison	<ul style="list-style-type: none"> Customer bills should be examined in the same number of months and seasons. Changes in per unit energy costs (kWh or Therms) as well as non-energy charges should be taken into account.
Communication Method	Considerations
Pre-Treatment Savings Expectation	<ul style="list-style-type: none"> Set the expectation that homes, occupancy, weather, and treatment measures are different and will yield different savings. Providing a conservative average percentage of savings for residential dwelling may be reasonable to attract participation, but assurances should not be given. Multi-family building managers can likely be given more custom energy or dollars savings if estimates are tailored to the building.
Post-Treatment Individual Report	<ul style="list-style-type: none"> A program may wish to create a per-home comparison of bill cost before and after weatherization program participation (via web or paper mail), but important caveats should be given about weather variation, energy unit cost, non-energy bill costs, occupancy, and other factors. Providing both web and paper reports will allow greater access for disadvantaged communities.
Post-Treatment Self-Guided Assistance	<ul style="list-style-type: none"> A program can provide guidance to customers on how to use available online bill analysis tools and provide assistance on how best to make a comparison from a pre- and post-treatment time period taking into account external factors like occupancy, weather, and energy and non-energy costs.

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Next Steps

Next Steps

- ComEd views the research performed by Resource Innovations as Phase 1 of an ongoing effort
- For Phase 2, ComEd is working with its internal data team to develop analytical capabilities that will allow for determination of individual bill impacts
 - We have developed a draft model capable of identifying customer participants who may not be seeing expected savings post-weatherization
- Future activities:
 - Identify complete lists of program participants with less-than-successful project outcomes, allowing follow-up
 - Development of a procedure and set of materials for follow-up
 - Apply learnings to consider whether we can develop a predictive modeling capability that would allow ranking of potential customers for a given EE offer
 - Enable targeted marketing efforts to those who would benefit most from participation
 - Improve program-level customer outcomes / cost-effectiveness